REMARKS

By this response, claims 1, 18, 33 and 48 have been amended without narrowing their scopes. Claims 1, 4-18, 21-33, 36-48 and 51-80 are pending in the application. Favorable consideration is respectfully requested in light of the following remarks.

A. First Rejection Under 35 U.S.C. § 103

Claims 1, 4-18, 21-33, 36-48, 51-64, 67, 68, 71, 72, 75, 76, 79 and 80 stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,469,089 to Wang et al. ("Wang"). The reasons for the rejection are set forth at numbered section (5), on pages 2-4 of the Office Action. The rejection is respectfully traversed.

Claim 1 recites a rubber composition comprising a diene elastomer, a reinforcing inorganic filler, a coupling agent providing the bond between the inorganic filler and the elastomer. The inorganic filler comprises a silicon carbide having (a) a BET specific surface area of between 20 and 200 m^2/g; (b) an average particle size by mass, noted d_w, of between 10 and 350 nm; wherein the silicon carbide constitutes more than 50% by volume of total reinforcing filler and the amount of silicon carbide is greater than 50 phr.

The Office Action acknowledges that Wang does not disclose a rubber composition comprising an inorganic filler comprising a silicon carbide that has the claimed average particle size by mass. However, the Office Action contends that Wang discloses silicon carbides having a BET surface area falling within the scope of the claims, and based on these BET surface area values, Wang's silicon carbides **intrinsically** have an average particle size of between 10 and 350 nm, as recited in claim 1.

The Office Action further asserts that Wang's silicon carbide exhibits the presently claimed disagglomeration rate because "such a property is evidently dependent on the material's surface area and chemical composition which determines hardness and thus disagglomeration rate."

The Office Action acknowledges that Wang **defines** the "second filler" as a "reinforcing" filler and also distinguishes between "wet skid enhancing" fillers and "reinforcing" fillers. Wang discloses SiC as an exemplary "wet skid enhancing filler," but **not** as a "reinforcing filler." See Applicants' remarks at page 17 of the Amendment filed on October 18, 2005. Although Wang fails to suggest that SiC is a "reinforcing filler" as this specific type of filler is described in Wang, the Office Action states:

> [I]t is the examiner's position that the silicon carbide taught by Wang et al is **intrinsically** a reinforcing filler (**the present disclosure even teaches such**), **regardless of how Wang et al defines it**, and that the presently claimed vol % relative amounts of silicon carbide filler and other filler are clearly met by Wang et al. (Emphasis added).

The Office Action further asserts that it would have been obvious to utilize the teachings of Wang to obtain a rubber composition reinforced with a silicon carbide "given that the silicon carbide **intrinsically** provides for the reinforcement capabilities as shown above in any of the amounts taught by Wang et al" (emphasis added), and thereby arrive at the claimed subject matter.

Applicants respectfully disagree with these assertions for at least the following reasons.

1. **Particle Size**

Although Wang does not disclose or suggest a rubber composition comprising a silicon carbide having the claimed average particle size by mass of between 10

and 350 nm, the Official Action contends that the claimed value is intrinsic, i.e., **inherent**, in Wang's silicon carbide based on BET surface area values of 31.9 m^2/g and 55.9 m^2/g of the silicon carbide disclosed by Wang (column 8, lines 64-66).

The inherency position set forth in the Office Action is an improper basis for the rejection under 35 U.S.C. § 103. The Examiner has cited no evidence showing that it was known to one skilled in the art at the time of the invention that silicon carbide having a BET surface area of 31.9 m^2/g or 55.9 m^2/g **must** have a certain average particle size by mass. Rather, the Office Action takes the position that Wang's silicon carbide must have the claimed average particle size because the BET surface area values of 31.9 m^2/g or 55.9 m^2/g fall within the range for the silicon carbide recited in claim 1.

Applicants submit that one skilled in the art would could not deduce the claimed average particle size from Wang's BET surface area value. Wang's examples using SiC products having a BET surface area of 31.9 m^2/g and 55 m^2/g provide no information concerning the average size of these particles. In the rejection set forth at section (6) of the Office Action discussed below, the Examiner cites Peter A. Ciullo and Norman Hewitt, "The Rubber Formulary" ("Ciullo"). Ciullo refutes the basis for the inherency position taken in the Office Action with regard to Wang. That is, Ciullo explains at page 27, last paragraph, lines 5-7, that "[t]he **shape** of the particle is also important. Particles with a planar surface have more surface available for contacting the rubber than spherical particles with **an equivalent average particle diameter**" (emphasis added). According to Ciullo, particles that have **different BET surface areas** can have the **same average particle diameter**, because particle shape is also important. Thus, even if a person skilled in the art knows the BET surface area of particles, such as SiC particles, that

person would **not** know **intrinsically**, i.e., necessarily, the average size of the particles based on that information.

Additional information regarding the relationship between particle size and particle shape is provided in R.M. German, *Powder Metallurgy Science*, Metal Powder Industries Federation, 1984, pp. 12-15, which is submitted herewith for the Examiner's convenience. German explains in the section entitled "Particle Size" at page 13, lines 1-3, that particle size depends on factors including the particle shape. German further explains in this same section at page 13, lines 14-18 that, as the particle shape becomes more complex, it becomes more difficult to define a single size parameter. As explained at page 14, lines 2-4 of German, "[o]bviously, the more irregular the particle shape the greater the difficulty in assigning a unique particle size." German thus provides additional evidence that a person skilled in the art would **not** know **intrinsically** the average size of the Wang's SiC particles having a BET surface area of 31.9 m^2/g and 55 m^2/g.

The position taken in the Office Action also fails to appreciate that inherency and obviousness are distinct concepts. The Office Action has provided no **evidence** that supports the position that Wang's silicon carbide **must** have the claimed average particle size, but **not** some other average particle size, and that one skilled in the art would have known this. The particle size of Wang's examples using SiC products having a BET surface area of 31.9 m^2/g and 55 m^2/g is unknown. Courts have stated, however, that obviousness cannot be based on what is **unknown**. A result, **even if inherent**, but if **not known** at the time of the invention, **cannot** provide a proper basis for rejecting claimed subject matter as being **obvious**. *See In re Shetty*, 195 U.S.P.Q. 753, 756-57 (C.C.P.A. 1977); and *In re Spormann*, 150 U.S.P.Q. 449, 452 (C.C.P.A. 1966).

In *In re Grasselli*, 218 U.S.P.Q. 769, 776 (Fed. Cir. 1983), the Court determined that the evidence offered to support a rejection under 35 U.S.C. § 103 did not establish inherency:

> If appellant's catalyst is inherent in the Japanese patent, it has not been established by the record here and **obviousness cannot be predicated on that which is unknown**. (Emphasis added).

In *Kloster Speedsteel AB v. Crucible Inc.*, 230 U.S.P.Q. 81, 88 (Fed. Cir. 1986), the court stated:

> Stora bases a major argument on the undisputed fact that size change uniformity is an inherent property of the alloy disclosed in the '518 patent. That argument is unpersuasive when confronted by **Stora's failure to establish at trial that that inherency would have been obvious to those skilled in the art when the invention of claim 4 was made**. **Inherency and obviousness are distinct concepts.** (Emphasis added; citations omitted).

Accordingly, because the Office Action has provided no evidence showing that it was known in the art at the time of the invention that Wang's silicon carbide having a BET surface area of 31.9 m^2/g or 55.9 m^2/g **must** have the recited average particle size, the allegation of obviousness is improper for at least this reason.

2. Wang's "Reinforcing" and "Wet Skid Enhancing" Fillers

As discussed above, the Office Action alleges that Wang's silicon carbide is **intrinsically** a reinforcing filler, **regardless of how Wang defines it**, and that the presently claimed volume % relative amounts of silicon carbide filler and other filler are met by Wang. In support of this position, the Office Action asserts that the present disclosure even teaches that silicon carbide is a "reinforcing filler."

Applicants submit that this position first improperly ignores the express teachings of Wang itself. Wang specifically categorizes filler materials into "reinforcing" and "wet skid enhancing" fillers, but does not suggest that silicon carbide filler is a "reinforcing" filler within this categorization scheme. Applicants

submit that one skilled in the art would understand that Wang does **not** consider silicon carbide to be a "reinforcing" filler, as this term is explicitly described in Wang. The Examiner's assertions to the contrary improperly ignore the express teachings of Wang.

The Office Action secondly improperly relies on **Applicants' disclosure** to support the position that Wang's silicon carbide can be considered as a "reinforcing" filler. It was the **present inventors** who surprisingly discovered that SiC can also be a reinforcing filler in the claimed rubber composition. See, e.g., the description at page 3, line 5 to page 4, line 8, of the present specification. The Examiner has improperly used the inventors' own teachings against them in trying to provide a basis for the rejection. As stated in *In re Lee*, 61 U.S.P.Q.2d, 1430, 1434 (Fed. Cir. 2002):

> It is improper, in determining whether a person of ordinary skill would have been led to use this combination of references, simply to [use] that which the inventor taught against its teacher. (Citation omitted).

Accordingly, because the Office Action improperly ignores Wang's express teachings that contradict the position that Wang's silicon carbide can be considered to be a reinforcing filler within the context of Wang's disclosure, and also improperly relies on the inventors' own teachings, but not the actual teachings of the applied art, the rejection of claim 1 should be withdrawn.

Claims 4-17, 67 and 68, which depend from claim 1, are also patentable over Wang for at least the same reasons as those for which claim 1 is patentable. Moreover, these dependent claims recite additional features that provide additional bases for patentably distinguishing over Wang. For example, Wang is silent with respect to the claimed disagglomeration rate α (claims 11-13). As discussed above,

however, the Office Action asserts that Wang's silicon carbide **inherently** exhibits the presently claimed disagglomeration rate because such property "is evidently dependent on the material's surface area and chemical composition." This position presumes some specific relationship between different features that cannot be in fact reliable to a person skilled in the art. Applicants submit that the disagglomeration rate is **not** dependent solely on the material's surface area and chemical composition. The Office Action has provided no evidence supporting this contention, or showing that this alleged relationship is known in the art. The disagglomeration rate depends on other factors, including, e.g., how a product is synthesized, its structure and its origin. For example, it is well known that silica with the **same** BET surface area can be highly dispersible, or not. In other words, the disagglomeration rate can be completely different for the same product (in this case due to differences in synthesis). Accordingly, the Office Action has not established any basis for the position that Wang's silicon carbide would inherently, i.e., must, have a disagglomeration rate α as recited in any one of claims 11-13.

Independent claim 18 is directed to a process for obtaining a rubber composition, independent claim 33 is directed to a tire comprising a rubber composition, and Independent claim 48 is directed to a tire tread comprising a rubber composition. Wang fails to suggest at least the features regarding the inorganic filler comprising silicon carbide recited in claims 18, 33 and 48. Thus, claims 18, 33 and 48 are also patentable over Wang. Dependent claims 21-32, 71 and 72; 36-47, 75 and 76; and 51-64, 79 and 80, are also patentable over Wang for at least the same reasons as those for which claims 18, 33 and 48, respectively, are patentable. Therefore, withdrawal of the rejection is respectfully requested.

B. Second Rejection Under 35 U.S.C. § 103

Claims 1, 4-18, 21-33, 36-48 and 51-80 stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,121,346 to Visel et al. ("Visel") in view of Ciullo. The reasons for the rejection are set forth at numbered section (6), on pages 4-6 of the Office Action. The rejection is respectfully traversed.

The Office Action appears to assert that Visel discloses a rubber composition comprising an inorganic filler comprising a silicon carbide that has the claimed average particle size of between 10 and 350 nm. The Office Action acknowledges that Visel does not disclose the claimed BET specific surface area, but contends that the "surface area of a filler particle is a critical parameter when determining its reinforcing effects," and that it would have been obvious to use a suitable surface area to obtain a filler falling within the claimed surface area range. The Office Action relies on Ciullo as allegedly supporting this position. Applicants respectfully disagree with these assertions.

1. Particle BET Specific Surface Area

Visel discloses elastomeric compositions including fillers composed of aggregates of small and large particles. The particles of the aggregates can be the same or a different filler (column 4, lines 1-5). See also, e.g., column 1, lines 26-29; and column 3, lines 44-53, of Visel. A list of suitable large particles includes SiC and Visel discloses that commercially available silicon carbides range in particle size from 5 to 150 nm (column 3, lines 62-64; column 5, lines 9-11).

Visel's fillers include **small particles grafted on large particles**. Visel discloses that the desired reinforcing properties are obtained by this specific agglomeration of two different sizes of particles grafted on each other. Visel does

not suggest that such properties could be obtained by the use of only one size of particles without grafting.

Visel does not suggest using SiC having a BET specific surface area of between 20 and 200 m^2/g as a filler. However, the Office Action contends that the claimed BET specific surface area would have been obvious. The Office Action further contends that, based on Ciullo's disclosure that most reinforcing precipitated silicas have a surface area per unit weight of 125 to 200 m^2/g (page 28, lines 3-4), this same value "can be inferred" in Visel's silicon carbide. Applicants disagree.

As discussed above, particles that have different specific surface area values from each other can have the **same average particle diameter**. Accordingly, a particular average particle diameter does not intrinsically correspond to one specific BET specific surface area, as the particle shape is also important and affects the particle specific surface area. Visel does not disclose that the silicon carbide particles have any specific shape and thus provides no basis to determine the BET specific surface area of these particles. Visel does not suggest that the "large" silicon carbide particles must have a particular BET specific surface area, and Ciullo does not cure this deficiency of Visel.

Moreover, in light of the fact that Visel's aggregates require **both** "large" and "small" particles, even assuming that Visel's elastomeric composition contains silicon carbide, the Office Action has not established that the claimed silicon carbide BET specific surface area would be desirable for Visel's aggregates. The Examiner's position ignores the effects of Visel's "small" particles on the desired characteristics and properties of the elastomeric composition. Furthermore, Visel does not disclose or suggest that the specific surface area of either of the "small" or "large" particles is "critical" with respect to the results desired by Visel. As such, the Office Action has

not established that it would have been obvious, in Visel's compositions, to have silicon carbide particles having any particular BET specific surface area, much less the claimed BET specific surface area. Accordingly, the rejection of claim 1 should be withdrawn.

Dependent claims 4-17 and 65-68 are also patentable over Visel for at least the same reasons as those for which claim 1 is patentable. Moreover, these dependent claims recite additional features that provide additional bases for patentably distinguishing over the applied references. For example, Visel and Ciullo are silent with respect to the claimed disagglomeration rate α (claims 11-13). As discussed above, the Office Action has provided no evidence showing that the alleged relationship for the disagglomeration rate is known in the art. Accordingly, the Office Action has not established any basis for the position that Visel's silicon carbide would necessarily have a disagglomeration rate α as recited in any one of claims 11-13.

Regarding independent claims 18, 33 and 48, Visel and Ciullo fail to suggest at least the claimed features regarding the inorganic filler comprising silicon carbide. Thus, claims 18, 33 and 48 are also patentable. Dependent claims 21-32 and 69-72; 36-47 and 73-76; and 51-64 and 77-80 are also patentable for at least the same reasons as those for which claims 18, 33 and 48, respectively, are patentable. Therefore, withdrawal of the rejection is respectfully requested.

C. Conclusion

For the foregoing reasons, allowance of this application is respectfully requested. If there are any questions concerning this paper, or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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